

Amendments To Specification

On page 6, lines 1-14, please substitute the following replacement paragraph.

The method includes the step of providing a substrate containing the components, and including locator openings for locating and handling the substrate. The substrate can be in the form of a panel (or a strip) containing one or more single rows of components, or alternately a panel containing one or more arrays of components in a matrix of rows and columns. The method also includes the step of providing a prestage alignment base having locator pins, and a nest and clamping mechanism mountable to the prestage alignment base for holding the substrate. The prestage alignment base and the nest can be configured for use with a particular substrate, such as substrates having components in one or more rows, or substrates having one or more arrays of components in a matrix of rows and columns.

On page 14, lines 14-27, please substitute the following replacement paragraph.

Next, as shown in Figure 5G, a sawing step is performed in which the saw blades 60-1, 60-2 are moved in z-directions as required to engage or disengage the substrate 10A, and the sawing base 58 is moved in axial directions, as required such that the saw blades 60-1, 60-2 separate the individual components 12 from the substrate 10A. During the sawing step, the substrate 10A and the components 12 are now retained on the nest 52 by the vacuum applied through the vacuum openings 76. In addition, there are no locator pins 72 (Figure 5A) on the sawing base 58 to compromise the operation of the saw blades 60-1, 60-2. Following the sawing step, the vacuum is removed and the singulated components 12 are removed from the nest 52. In addition, the remaining portions of the substrate 10A can be removed from the nest 52 as well.

Listing Of Claims

1. (currently amended) A method for singulating semiconductor components contained on a substrate having a plurality of locator openings comprising:

providing a nest, a base configured to hold the nest,
~~and a clamping mechanism configured to hold the substrate~~
plurality of locator pins on the base configured to engage
the locator openings;

placing the nest on the base;

placing the substrate on the nest and aligning the
substrate using a plurality of the locator pins;
~~configured to engage the locator openings;~~

~~holding the substrate on the nest using the clamping~~
~~mechanism;~~

removing the nest from the base; and
~~locator pins from the locator openings;~~

~~removing the clamping mechanism;~~

~~applying a vacuum to the substrate; and~~

~~sawing the substrate held on the nest by the vacuum~~
~~into separate components.~~

2. (currently amended) The method of claim 1 further comprising providing a clamping mechanism attachable to the nest and holding the substrate on the nest prior to the removing step using the clamping mechanism.

~~wherein the locator pins are mounted to an alignment base~~
~~configured to hold the nest.~~

3. (currently amended) The method of claim 1 wherein the base comprises a plurality of mounting studs configured to engage a plurality mounting openings on the nest.
~~locator pins are mounted to the clamping mechanism.~~

4. (currently amended) The method of claim 1 wherein the locator pins ~~are mounted to a base for holding the nest, and with the nest on the base, the locator pins~~ project through openings in the nest.

5. (original) The method of claim 1 wherein the components comprise an element selected from the group consisting of packages, multi chip modules, printed circuit boards, interconnects, bumped dice and bare dice.

6. (original) The method of claim 1 wherein the substrate comprises a panel and the components are arranged on the panel in at least one row.

7. (original) The method of claim 1 wherein the substrate comprises a panel and the components are arranged on the panel in a matrix of rows and columns.

8. (currently amended) The method of claim 1 further comprising providing a sawing base configured to hold the nest and holding the nest on the sawing base ~~and to apply the vacuum to the substrate~~ during the sawing step.

9. (currently amended) A method for singulating semiconductor components contained on a substrate having a plurality of locator openings comprising:

- providing a nest configured to hold the substrate;
- providing an alignment base comprising a plurality of locator pins configured to engage the locator openings;
- placing the substrate on the nest;
- placing the nest on the alignment base and aligning the substrate on the nest using the locator pins;
- providing a sawing base configured to hold the nest and the substrate for sawing;
- removing the nest from the alignment base;

placing the nest ~~and the substrate~~ on the sawing base;
and
sawing the substrate into separate components.

10. (original) The method of claim 9 wherein the sawing base comprises a vacuum opening configured to hold the substrate during the sawing step.

11. (currently amended) The method of claim 9 wherein the nest comprises a detachable clamping mechanism which is detached and further comprising detaching the clamping mechanism prior to the sawing step.

12. (original) The method of claim 9 wherein the nest comprises a detachable clamping mechanism and at least some of the locator pins are mounted to the clamping mechanism.

13. (original) The method of claim 9 further comprising clamping the substrate to the nest following the placing the nest step, then unclamping the substrate from the nest prior to the sawing step.

14. (previously amended) A method for singulating semiconductor components contained on a substrate having a plurality of locator openings comprising:

providing an alignment base comprising a plurality of locator pins configured to engage the locator openings;

providing a nest mountable to the alignment base configured to hold the substrate;

placing the nest on the alignment base;

aligning the substrate on the nest using the alignment base and the locator pins;

providing a sawing base for holding the nest comprising a vacuum opening configured to hold the substrate on the nest;

removing the nest from the alignment base;
mounting the nest to the sawing base with the vacuum opening holding the substrate on the nest; and
sawing the substrate into separate components.

15. (original) The method of claim 14 wherein the substrate comprises a panel, and the components are arranged on the panel in at least one row.

16. (original) The method of claim 14 wherein the substrate comprises a panel, and the components are arranged on the panel in one or more matrix arrays of rows and columns.

17. (original) The method of claim 14 further comprising providing a clamping mechanism configured for attachment to the nest for holding the substrate on the nest, attaching the clamping mechanism to the nest following the aligning step, then removing the clamping mechanism from the nest prior to the sawing step.

18. (original) The method of claim 17 further comprising providing the clamping mechanism with at least some of the locator pins.

19. (original) A method for singulating semiconductor components contained on a substrate:

providing the substrate with a plurality of locator openings;

providing a nest configured to hold the substrate comprising a plurality of openings;

providing a clamping mechanism attachable to the nest for clamping the substrate to the nest;

providing an alignment base comprising a plurality of locator pins configured to engage the locator openings;

placing the nest on the alignment base with the locator pins projecting from the openings in the nest;
placing the substrate on the nest with the locator pins engaging the locator openings;
attaching the clamping mechanism to the nest to clamp the substrate to the nest;
removing the nest from the alignment base;
providing a sawing base comprising a vacuum opening configured to apply a vacuum to the substrate held on the nest;
applying the vacuum through the sawing base to the substrate;
removing the clamping mechanism from the nest; and
sawing the substrate held on the nest by the vacuum into separate components.

20. (original) The method of claim 19 further comprising providing the clamping mechanism with a plurality of second locator pins configured to engage the locator openings.

21. (original) The method of claim 19 further comprising providing a saw blade configured to perform the sawing step.

22. (original) The method of claim 19 wherein the clamping mechanism comprises latches for engaging the nest, and a compliant pad configured to engage the components.

23. (original) The method of claim 19 wherein the nest comprises a plurality of recesses configured to retain the components on the substrate.

24. (original) The method of claim 19 wherein the alignment base comprises a plurality of first mounting

studs configured to engage a plurality mounting openings on the nest.

25. (original) The method of claim 19 wherein the sawing base comprises a plurality of second mounting studs configured to engage the mounting openings on the nest.

26-55 (canceled)

56. (new) A method for singulating semiconductor components contained on a substrate having a plurality of locator openings comprising:

- providing a base and a nest configured to hold the substrate;

- providing a clamping mechanism configured to hold the component on the base and a plurality of locator pins on the clamping mechanism configured to engage the locator openings;

- placing the nest on the base and the substrate on the nest;

- attaching the clamping mechanism to the nest;

- aligning the substrate on the nest during the attaching step using the locator pins;

- providing a sawing base configured to hold the nest and the substrate for sawing;

- removing the nest from the base;

- placing the nest on the sawing base; and

- sawing the substrate into separate components.

R marks

Restriction

Withdrawn claims 26-55 have been canceled.

Allowed Claims

Claims 19-25 have been allowed.

Objections to Drawings

The drawings have been objected to because reference numerals 60-1 and 60-2 shown in Figure 5G are not mentioned in the specification. In response to this objection, the specification has been amended at page 14, lines 15, 18 and 24 to add reference numerals 60-1 and 60-2.

The specification has also been amended at page 6, line 12 to correct an informality.

Rejections Under 35 USC §112

Claims 1-8 have been rejected under 35 USC §112, second paragraph, as being indefinite. These 35 USC §112 rejections are due to the indefinite recitations in claim 1 of "a plurality of locator pins", and "the nest by the vacuum into separate components".

In response to these rejections, claim 1 has been amended to recite the step of "providing a nest, a base configured to hold the nest, and a plurality of locator pins on the base configured to engage the locator openings". With these recitations, the mounting of the locator pins has been made more definite. In addition, claim 1 has been amended to remove the recitation of a "vacuum". With these recitations the 35 USC §112 rejections should have been overcome.

Claims 1-18 have been rejected under 35 USC §112, second paragraph because the step of "removing the nest from the alignment base" has been omitted. In response to these rejections, claims 1, 9 and 14 have been amended to recite a "removing the nest from the base" step. In addition, claims 1 and 14 have been amended to recite the step of "placing the nest on the base". Independent claim 9 had already included a similar "placing" step.

In addition to these amendments, dependent claims 2, 3, 4, 8 and 11 have been amended to be consistent with the amended independent claims. Further, independent claim 56 has been added. Claim 56 is similar to independent claim 9 but recites that the locator pins are on the clamping mechanism. Antecedent basis is provided in Figure 7, and on page 16, line 24 to page 17, line 12 of the specification.

Conclusion

In view of the amendments and arguments, favorable consideration and allowance of claims 1-25 and 56 is requested. Should any issues remain, the Examiner is asked to contact the undersigned by telephone.

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July 28, 2003
Date of Signature

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